

- 13 -

C L A I M S

1. A method for dispersing gas bubbles in a multiphase fluid transportation conduit, the method comprising inserting at least one bubble breaker assembly in the conduit, characterised in that the assembly comprises a plurality of orifices that are located in a substantially eccentric position relative to a central axis of the conduit and that the conduit is a production tubing in an oil production well or a riser connected to such a well.

2. The method of claim 1, wherein at least one bubble breaker assembly comprises a disk-shaped plate in which at least two eccentric orifices are arranged.

3. The method of claim 1 or 2, wherein a plurality of bubble breaker assemblies are arranged at selected distances along the length of the conduit.

4. The method of claim 3, wherein the at least two of said bubble breaker assemblies comprise disk-shaped plates in which different patterns of eccentric orifices are arranged.

5. The method of any preceding claim, wherein at least one bubble breaker assembly comprises a pair of eccentric orifices that are located substantially symmetrically relative to a plane of symmetry in which the central axis of the conduit lies.

6. The method of claim 1, wherein at least one bubble breaker assembly comprises at least three eccentric orifices.

7. The method of any preceding claim, in which the multiphase fluid transportation conduit is a production tubing in an oil production well.

- 14 -

8. The method of claim 7, wherein lift gas is injected at one or more downhole gas injection points spaced along the length of the production tubing to enhance oil production from the well, and one or more bubble breaker assemblies with eccentric orifices are arranged at selected distances downstream of the lift gas injection points.

9. The method of claim 8, wherein the lift gas is injected through at least one lift gas injection orifice in which a porous membrane is arranged such that finely dispersed gas bubbles are injected into the oil production conduit.

10. A method of producing crude oil, wherein large gas slugs, that are known as Taylor bubbles, are broken up into finely dispersed smaller gas bubbles by means of one or more bubble breaker assemblies with eccentric orifices in accordance with the method according to claim 8.

11. The method of claim 10, wherein the ratio between the injected flux of lift gas (Q_g) and the flux of crude oil (Q_l) is less than 400 standard cubic meters per cubic meter.

12. A system for dispersing gas bubbles in a multiphase fluid transportation conduit, the system comprising at least one bubble breaker assembly which is arranged within the conduit, characterised in that the assembly comprises a plurality of orifices that are located in a substantially eccentric position relative to a central axis of the conduit and that the conduit is a production tubing in an oil production well or a riser connected to such a well.

- 15 -

13. The system of claim 12, wherein at least one bubble breaker assembly comprises a disk-shaped plate in which at least two eccentric orifices are arranged.

5 14. The system of claim 12 or 13, wherein a plurality of bubble breaker assemblies are arranged at selected distances along the length of the conduit.

10 15. The system of claim 14, wherein the at least two of said bubble breaker assemblies comprise disk-shaped plates in which different patterns of eccentric orifices are arranged.

15 16. The system of any one of claims 12-15, wherein at least one bubble breaker assembly comprises a pair of eccentric orifices that are located substantially symmetrically relative to a plane of symmetry in which the central axis of the conduit lies.

17. The system of claim 12, wherein at least one bubble breaker assembly comprises at least three substantially equidistant eccentric orifices.

20 18. The system of claim 17, wherein the accumulated cross-sectional area of the openings of orifices is less than fifty per cent of the cross-sectional area of the fluid transportation conduit.